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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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WILLIAM S. WOODS

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7590

08/26/2004

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. BOX 2938  
MINNEAPOLIS, MN 55402

EXAMINER

CHAU, COREY P

ART UNIT

PAPER NUMBER

2644

DATE MAILED: 08/26/2004

10

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/393,463

Applicant(s)

WOODS, WILLIAM S.

Examiner

Corey P Chau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23, 40 and 46 is/are rejected.
- 7) ☐ Claim(s) 24-39, 41-45, and 47-50 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2,3,4,5,9.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Objections***

1. Claim 27 is objected to because of the following informalities: On line 9, discloses "2p", which should be replaced with " $2\pi$ ". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 19, 21, 22, and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 19 recites the limitation "the combined signal" in line 2. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 21 recites the limitations "the output" in line 1 and "the amplitude and phase" in line 2. There is insufficient antecedent basis for this limitation in the claim.
6. Claim 22 recites the limitations "the set of coefficients" in line 1 and "the filter adjuster" in line 2. There is insufficient antecedent basis for this limitation in the claim.
7. Claim 40 recites the limitation "the input" in line 4. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 5, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5259033 to Goodings et al (hereafter as Goodings) in view of U.S. Patent No. 6097823 to Kuo.

10. Regarding Claim 1, Goodings discloses a method of processing audio signals (i.e. hearing aid having compensation for acoustic feedback), comprising inhibiting at least one feedback component of an input audio signal by adjusting a feedback-inhibiting filter (27) using a subaudible probe signal (33) (i.e. noise signal having a flat spectral characteristic over a more limited range converging the expected range of oscillation frequencies normally would be adequate) (Fig. 1; column 7, lines 3-28; column 8, lines 29-33). Goodings discloses a subaudible probe signal is injected into the system, but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e. modeling signal). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made

to utilize a generator that generates a chirp signal (i.e. a chirp signal is an equivalent probe signal wherein at an instantaneous moment it is a narrow band signal) to inject into the system as a probe signal.

11. Regarding Claim 2, Goodings discloses a method of processing at least one audio signal (i.e. hearing aid having compensation for acoustic feedback) comprising: filtering a processed signal by a notch filter to form a filtered signal (i.e. the adaptive filter models the path and then takes the inverse of the modeled signal, this functions as a notch filter); and sending a signal (i.e. probe signal) having a first bandwidth into the filter signal to form a probe signal to probe a feedback path having a second bandwidth (i.e. noise signal having a flat spectral characteristic over a more limited range converging the expected range of oscillation frequencies normally would be adequate) (Fig. 1; column 7, lines 3-28; column 8, lines 29-33). ). Goodings discloses a subaudible probe signal is injected into the system, but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e. modeling signal).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a generator that generates a chirp signal (i.e. a chirp signal is an equivalent probe signal wherein at an instantaneous moment it is a narrow band signal) to inject into the system as a probe signal.

12. Regarding Claim 5, Goodings as modified discloses sending the subaudible narrowband signal comprises sending the subaudible narrowband signal having a level, wherein the level of the subaudible narrowband signal is determined using an audibility model (column 10, lines 61-68).

13. Regarding Claim 6, Goodings as modified discloses sending the subaudible narrowband signal comprises sending the subaudible narrowband signal at a level determined by an audibility model, wherein the audibility model has a criterion level, and wherein the level of the subaudible narrowband signal is adjusted so as to be about the criterion level of the audibility model (column 10, line 61 to column 11, line 12).

14. Regarding Claim 7, Goodings as modified discloses wherein sending the subaudible narrowband signal comprises sending the subaudible narrowband signal at a level determined by an audibility model, wherein the audibility model has a criterion level, and wherein the level of the subaudible narrowband signal is adjusted so as to be about below the criterion level of the audibility model (column 10, line 61 to column 11, line 12).

15. Claims 8, 14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5259033 to Goodings in view of U.S. Patent No.

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6097823 to Kuo as applied to claims 1, 2, 5, 6, and 7 above, and further in view of "Feedback Cancellation in Hearing Aids: Results from a Computer Simulation", by Kates.

16. Regarding Claim 8, Goodings discloses a system for enhancing audio signal (i.e. hearing aid having compensation for acoustic feedback) comprising: at least one notch filter to filter a processed signal (i.e. the adaptive filter models the path and then takes the inverse of the modeled signal, this functions as a notch filter) and at least one probe generator to generate a probe signal (i.e. noise signal having a flat spectral characteristic over a more limited range converging the expected range of oscillation frequencies normally would be adequate) (Fig. 1; column 7, lines 3-28; column 8, lines 29-33). Goodings discloses a subaudible probe signal is injected into the system, but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e. modeling signal). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a

generator that generates a chirp signal (i.e. a chirp signal is an equivalent probe signal wherein at an instantaneous moment it is a narrow band signal) to inject into the system as a probe signal. Goodings as modified does not expressly disclose a detector to detect undesired feedback in an input signal. Kates discloses a feedback detection to determine if a sinusoid has power above a preset threshold is present at the microphone (i.e. input signal) and if so, the normal hearing aid processing is disengaged and a noise is used as a probe sequence is injected into the system. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Goodings as modified with the teaching of Kates to incorporate a feedback detector to provide detection of a input signal above a threshold and if the input signal is above the threshold, the hearing aid is disengage and noise is injected into the system.

17. Regarding Claim 14, Goodings as modified discloses the at least one probe generator has a first bandwidth, wherein the feedback path has a second bandwidth, and wherein the at least one probe generator is configured so as to center the first bandwidth of the at least one probe generator on the second bandwidth of the feedback path (Fig. 3, lines 17-48).

18. Regarding Claim 16, Goodings as modified discloses a combiner (21) to provide a combined signal, wherein the combiner combines the filtered signal of the at least one notch filter and the probe signal of the at least one probe generator.

19. Regarding Claim 17, Goodings as modified discloses a signal processor to provide the processed signal (7).



20. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5259033 to Goodings in view of U.S. Patent No. 6097823 to Kuo as applied to claims 1, 2, 5, 6, and 7 above, and further in view of "Feedback Cancellation in Hearing Aids: Results from a Computer Simulation", by Kates, and U.S. Patent No. 4088835 to Thurmond et al. (hereafter as Thurmond).

21. Regarding Claim 18, Goodings as modified discloses the signal processor, but only generally; no specific hardware or software is taught. Therefore it would have been obvious to one having ordinary skill in the art to seek known signal processor.

Thurmond for example, discloses a compressor (i.e. compressive amplifier), which is a device well known for reducing the dynamic range of the signal which passes through it thereby limiting the maximum signal to a predetermined safe level without clipping (column 3 lines 59-68). It would have been obvious to one having ordinary skill in the art to employ any known signal processor, such as that of Thurmond. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the compressor of Thurmond.

22. Claims 1, 2, 3, 4, 8, 9, 10, 19, 20, 22, 23, 40, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Feedback Cancellation in Hearing Aids: Results from a Computer Simulation", by Kates in view of U.S. Patent No. 6097823 to Kuo.

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23. Regarding Claim 1, Kates discloses a method of processing audio signals (i.e. feedback cancellation in hearing aids), comprising inhibiting at least one feedback component of an input audio signal by adjusting a feedback-inhibiting filter using a probe signal (i.e. pseudorandom noise burst)(Fig. 4). Kates discloses a pseudorandom noise burst is injected into the system as a probe signal (Fig. 4; column 1, paragraph 3; column 5, paragraph 2), but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e. modeling signal). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a generator that generates a chirp signal (i.e. a chirp signal is an equivalent probe signal wherein at an instantaneous moment it is a narrow band signal) to inject into the system as a probe signal.

24. Regarding Claim 2, Kates discloses a method of processing at least one audio signal (i.e. feedback cancellation in hearing aids) comprising: filtering a processed signal by a notch filter to form a filtered signal (i.e. the adaptive filter models the path

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and then takes the inverse of the modeled signal, this functions as a notch filter); and sending a signal (i.e. probe signal) having a first bandwidth into the filter signal to form a probe signal to probe a feedback path having a second bandwidth. Kates discloses a pseudorandom noise burst is injected into the system as a probe signal (Fig. 4; column 1, paragraph 3; column 5, paragraph 2), but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e. modeling signal).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a generator that generates a chirp signal (i.e. a chirp signal at an instant is a narrow band signal) to inject into the system as a probe signal.

25. Regarding Claim 3, Kates as modified discloses comparing the probe signal to an input signal; and adjusting selectively an inhibiting filter so as to inhibit at least one audio artifact associated with the feedback path (i.e. for the LMS adaptive filter coefficient computation, the amplified noise probe sequence is the reference input to the adaptive filter and the difference between the microphone signal and the filtered probe

sequence is the error input. The Wiener filter, uses the cross correlation of the amplified pseudorandom noise sequence and the microphone signal to estimate the filter coefficients) (Fig. 4; column 6, paragraph 1).

26. Regarding Claim 4, Kates as modified discloses turning off selectively the operation of the notch filter when the inhibiting filter is adjusted (Fig. 4; column 9, paragraph 5).

27. Regarding Claim 8, Kates discloses a system for enhancing audio signal comprising: at least one detector (i.e. feedback detection) to detect undesired feedback in an input signal; at least one notch filter to filter a processed signal (i.e. the adaptive filter models the path and then takes the inverse of the modeled signal, this functions as a notch filter) and at least one probe generator to generate a probe signal. Kates discloses a pseudorandom noise burst is injected into the system as a probe signal (Fig. 4; column 1, paragraph 3; column 5, paragraph 2), but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e.

modeling signal). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a generator that generates a chirp signal (i.e. a chirp signal at an instant is a narrow band signal) to inject into the system as a probe signal.

28. Regarding Claim 9, Kates as modified discloses the at least one detector determines when the feedback path will be probed (Fig. 4).

29. Regarding Claim 10, Kates as modified discloses the at least one detector determines a range of frequencies at which the feedback path will be probed (i.e. the detection procedure uses an adaptive notch filter. The adaptive notch filter is adapted to track the frequency of the sinusoid and the coefficients are then copied to the IIR portion of the filter)(column 7, paragraphs 1 and 2).

30. All element of Claim 19 are comprehended by Claim 8. Claim 20 is rejected for the reasons stated above apropos to Claim 8.

31. All element of Claim 20 are comprehended by Claim 2. Claim 20 is rejected for the reasons stated above apropos to Claim 2.

32. All element of Claim 21 are comprehended by Claims 2 and 3. Claim 21 is rejected for the reasons stated above apropos to Claims 2 and 3.

33. Regarding Claim 22, Kates as modified discloses an inhibiting filter receptive to the set of filter coefficients from the filter adjuster to inhibit at least one feedback component of the input signal (Fig. 4; column 5, paragraph 1; column 6, paragraph 1).

34. Regarding Claim 23, Kates as modified discloses the inhibiting filter approximates the response of the feedback path to provide at least one feedback

component signal, wherein the at least one feedback component signal is subtracted from the input signal (Fig. 4).

35. Regarding Claim 40, Kates as modified discloses a filter adjuster to adjust an inhibiting filter to inhibit the undesired feedback by providing a set of filter coefficients, the filter adjuster comprising: a modeler (i.e. LMS adaptive filter or Wiener filter) receptive to a feedback indicator parameter (i.e. it is obvious that the LMS adaptive filter or Wiener filter receive a feedback parameter in order to generate coefficients), the input signal, and an output signal to model at least one response of the feedback path when the feedback path is probed with the narrowband subaudible audio probe signal at a predetermined frequency, wherein the modeler provides at least one sample that is representative of the at least one response of the feedback path (Fig. 4).

36. Claim 46 is essentially similar to Claim 40 and is rejected for the reasons stated above apropos to Claim 40.

37. Claims 2, 8, 11, 12, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6496581 to Finn et al (hereafter as Finn) in view of U.S. Patent No. 5259033 to Goodings, and further in view of U.S. Patent No. 6097823 to Kuo.

38. Regarding Claim 2, Finn discloses a method of processing at least one audio signal (i.e. feedback suppression) comprising filtering a processed signal by a notch filter to form a filtered signal (i.e. a sine wave or multiple sine waves can be generated from the detected feedback frequency and serve as the reference to the electronic noise

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control filter. The ENC filter will form notches at the exact frequencies, and adjust its attenuation until the offending feedback tones are minimized to the level of the noise floor) (Fig. 7; column 15, lines 4-16). Finn does not expressly disclose a probe signal to probe a feedback path. Goodings discloses a hearing aid having compensation for acoustic feedback comprising a noise generator to inject noise into the system in order to adapt a filter to produce an exact replica of an electrical signal corresponding to the acoustic feedback, the noise signal N, after attenuation (column 6, line 61 to column 7, line 28. Gooding discloses that the noise signal having a flat spectral characteristic over a more limited range converging the expected range of oscillation frequencies normally would be adequate (Fig. 1; column 7, lines 3-28; column 8, lines 29-33). ). Goodings discloses a subaudible probe signal is injected into the system, but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e. modeling signal). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a generator that generates a chirp

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signal (i.e. a chirp signal is an equivalent probe signal wherein at an instantaneous moment it is a narrow band signal) to inject into the system as a probe signal. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn with the teaching of Gooding as modified to incorporate a noise generator to inject noise into the system in order to adapt a filter to produce an exact replica of an electrical signal corresponding to the acoustic feedback, the noise signal N, after attenuation.

39. Regarding Claim 8, Finn discloses a system for enhancing audio signal (i.e. feedback suppression), wherein a sine wave or multiple sine waves can be generated from the detected feedback frequency (i.e. at least one detector) and serve as the reference to the electronic noise control filter. The ENC filter will form notches at the exact frequencies (i.e. notch filter), and adjust its attenuation until the offending feedback tones are minimized to the level of the noise floor (Fig. 7; column 15, lines 4-16). Finn does not expressly disclose a probe signal to probe a feedback path. Goodings discloses a hearing aid having compensation for acoustic feedback comprising a noise generator to inject noise into the system in order to adapt a filter to produce an exact replica of an electrical signal corresponding to the acoustic feedback, the noise signal N, after attenuation (column 6, line 61 to column 7, line 28. Gooding discloses that the noise signal having a flat spectral characteristic over a more limited range converging the expected range of oscillation frequencies normally would be adequate (i.e. since the signal is not wideband, it is obvious that it is narrowband) (Fig. 1; column 7, lines 3-28; column 8, lines 29-33). ). Goodings discloses a subaudible



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probe signal is injected into the system, but it would have been obvious to one having ordinary skill in the art to use any equivalent probe signal that would produce the same result, as taught by Kuo. Kuo discloses a digital hearing and method of feedback path modeling comprising a modeling signal generator (i.e. probe generator), wherein the modeling signal generator may use any number of techniques to generate the modeling signal. Modeling signal generator may generate a white-noise signal, a random signal, a chirp signal or virtually any type of signal capable of serving as a modeling signal to excite an environment or path (column 6, lines 10-24 and lines 48-60). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any know techniques to generate a probe signal (i.e. modeling signal).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a generator that generates a chirp signal (i.e. a chirp signal is an equivalent probe signal wherein at an instantaneous moment it is a narrow band signal) to inject into the system as a probe signal. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Finn with the teaching of Gooding as modified to incorporate a noise generator to inject noise into the system in order to adapt a filter to produce an exact replica of an electrical signal corresponding to the acoustic feedback, the noise signal N, after attenuation.

40. Regarding Claim 11, Finn discloses the at least one detector provides a feedback parameter, and wherein the at least one notch filter is receptive to the feedback parameter from the at least one detector (Fig 7).

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41. Regarding Claim 12, Finn does not expressly disclose the at least one detector provides a plurality of feedback parameters, and wherein the at least one notch filter is receptive to the plurality of feedback parameters from the at least one detector.

However it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the at least one detector provides a plurality of feedback parameters and the at least one notch filter is receptive to the plurality of feedback parameters from the at least one detector in order to provide a more efficient feedback cancellation system.

42. Regarding Claim 13, Finn discloses the at least one notch filter has a first bandwidth, wherein the undesired feedback has a second bandwidth, and wherein the at least one notch filter is configured so as to center the first bandwidth of the at least one notch filter on the second bandwidth of the undesired feedback (i.e. it is inherent that a notch filter is configured so as to center the first bandwidth of the at least one notch filter on the second bandwidth of the undesired feedback in order to attenuate the undesired noise)(Fig. 7; column 15, lines 4-16).

43. All element of Claim 15 are comprehended by Claim 8. Claim 15 is rejected for the reasons stated above apropos to Claim 8.

***Allowable Subject Matter***

44. Claims 24-39, 41-45, and 47-50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


***Conclusion***

45. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P Chau whose telephone number is (703)305-0683. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 23, 2004

  
**FORESTER W. ISEN**  
**SUPERVISORY PATENT EXAMINER**